Claims

1.   A device for directing input data toward destinations, comprising

an Internet Protocol (IP) packet forwarding facility for forwarding IP packets in the input data toward their destinations; and

an Asynchronous Transfer Mode (ATM) cell switching facility for switching ATM cells in the input data toward their destinations.

2.   The device of claim 1 further comprising a housing that houses both the IP packet forwarding facility and the ATM cell switching facility.

3.   The device of claim 1 further comprising an application specific integrated circuit (ASIC) that contains at least a portion of both the IP packet forwarding facility and the ATM cell switching facility.

4.   The device of claim 1 further comprising a common input from which the IP packet forwarding facility and the ATM cell switching facility receive the input data.

5.   The device of claim 1 wherein the input data contains synchronous optical network (SONET) frames and wherein the device further comprises a SONET deframer for deframing the SONET frames in the input data.

6.   The device of claim 1 wherein the device includes output ports for outputting data and wherein the ATM cell switching facility further comprises an ATM cell lookup for identifying which of the output ports to direct ATM cells in the input data toward, based on address information contained in the ATM cells.

7.   The devices of claim 1 wherein the device includes output ports for outputting data and wherein the IP packet forwarding facility further comprises an IP packet lookup for identifying which of the output ports to direct IP packets in the input data toward based on address information contained in the IP packets.

8.   An apparatus for directing input toward destinations, comprising:

    input ports for receiving input;

    output ports for outputting data;

    a director coupled to a selected one of the input ports for directing the input received at the selected input port to the output ports, said director directing layer 2 data units encapsulated by an OS1 layer 2 protocol to the output ports based on address information in the layer 2 data units and directing layer 3 data units encapsulated by a OS1 layer 3 protocol to the output ports based on address information in the layer 3 data units.

9.   The apparatus of claim 8 wherein the layer 2 data units are encapsulated by the Asynchronous Transmission Mode (ATM) protocol.

10.   The apparatus of claim 8 wherein the layer 3 data units are encapsulated by the Internet Protocol (IP).

11.   In a device for directing input data traffic received on input ports to output ports, a method comprising the steps of:

    providing an Internet Protocol (IP) lookup for identifying where to a direct an IP packet that is received on a selected input port;

    providing an Asynchronous Transfer Mode (ATM) lookup for identifying where to direct an ATM cell that is received on the selected input port;

    receiving a unit of input data at the selected input port;

    where the unit of data is an ATM cell, using the ATM lookup to identify which of the output ports to direct the unit of data; and

    where the unit of data is an IP packet, using the IP lookup to identify which of the output ports to direct the unit of data.

12.   The method of claim 11 wherein the device includes a Synchronous Optical Network (SONET) deframer and wherein the SONET deframer is used to deframe any SONET frames in the input data traffic received at the selected input port.

13. The method of claim 11 wherein a separate ATM lookup and IP lookup is provided for each of the input ports.

14. A device for directing both Internet Protocol (IP) packets containing address information identifying destinations and Asynchronous Transfer Mode (ATM) cells containing address information identifying destination toward their destinations, comprising:

input ports for receiving streams of input data;

output ports for outputting streams of data;

line cards for directing input data received at the input ports to the output ports, each said line card including:

an IP packets forwarding facility for directing IP packets in the input data to the output ports based on the address information contained in the IP packets; and

an ATM cell forwarding facility for directing ATM cells in the input data to the output ports based on the address information contained in the ATM cells.

15. The device of claim 14 further comprising an interconnect for interconnecting line cards to facilitate communication among the line cards.

The device of claim 14 further comprising a multiplexer positioned before a select one of the input ports to multiplex multiple data streams into a single input data stream.

17. The device of claim 14 wherein the input data is received as an OC-48 data stream.

The device of claim 14 further comprising a multiplexer positioned at a selected one of the output ports to multiplex output data from multiple tributaries into a single output data stream.

19. The device of claim 14 wherein the IP packet forwarding facility is part of an application specific integrated circuit (ASIC).

20. The device of claim 14 wherein the ATM cell forwarding facility is part of an applicator specific integrated circuit (ASIC).